



# LABORATORY VITEK INSTRUCTIONAL IMPLEMENTATION GUIDE

VERSION 5.2

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Office of Employee Education  
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## Introduction

This implementation guide provides you with information on how to set up and configure the VITEK Automated Instrument. The information contained in this document is divided into nine main categories.

- Introduction
- Site Preparation
- Confirm Data Transmission
- User Training and Education
- Verification and Workload
- Troubleshooting
- Glossary
- Appendix A - Full Download Record
- Appendix B - Upload Record

## Required Documentation

- Laboratory VITEK Literal Interface LA\*5.2\*12 patch documentation
- Laboratory Version 5.2 Planning and Implementation (PIG) Manual
- Laboratory V. 5.2 Technical Manual
- Bi-directional Computer Interface Specifications for bioLIAISON

## Required Patches

Laboratory VITEK Literal Interface Patch LA\*5.2\*12

## Special Instructions for the First-Time Computer User

If you are not very familiar with Veterans Health Information Systems and Technology Architecture (**VISTA**) software applications, we recommend that you study the DHCP User's Guide to Computing. This orientation guide is a comprehensive handbook benefiting first time users of any **VISTA** application. The purpose of the introductory material is to help you become familiar with basic computer terms and the components of a computer. It is reproduced and distributed periodically by the Kernel Development Group. To request a copy, contact your local Information Resources Management (IRM) staff.

## Special Notations

In this manual, the user's response is bolded. The bolded part of the entry is the letter or letters that must be typed so that the computer can identify the response. In most cases, you need only enter the first few letters. This increases speed and accuracy.

Every response you type in must be followed by pressing the Return key (or Enter key for some keyboards). Whenever the Return or Enter key should be pressed, you will see the symbol <**RET**>. This symbol is not shown but is implied if there is bolded input.

Within the examples representing actual terminal dialogues, editorial comments are enclosed in brackets and will not appear on the screen.

To stop what you are doing, enter an up-arrow (^). You may use the up-arrow at almost any prompt to terminate the line of questioning and return to the previous level in the routine. Continue entering up-arrows to completely exit the system.

## On-line Help

On-line help is available at almost any prompt in the software. Entering a question mark (?) will provide information to help you answer the prompt. In some instances entering two or three question marks will provide even further information.

## **Site Preparation**

### **Interface Validation**

1. Select port on the Laboratory System Interface (LSI).
2. Select an unused port on the LSI and validate it for proper conductivity, baud rate, parity, etc. Validate by connecting a Cathode Ray Tube (CRT) directly to the port.

### **Wiring and Conductivity**

Refer to the Laboratory VITEK Literal Interface Patch LA\*5.2\*12 documentation, page 17.

### **Test Equipment**

This interface uses the LSI and testing the equipment is not applicable.

### **VISTA Configuration**

Run the Kernel Installation and Distribution System(KIDS) installation of LA\*5.2\*12. Refer to the Laboratory VITEK Literal Interface Patch LA\*5.2\*12 documentation, pages 21 through 24.

## File Configuration and Edits

### ETIOLOGY file (#61.2)

Refer to the Planning and Implementation (PIG) manual pages 71 through 72.

1. Print the organism codes using the Organism Code Print option. The printout should show blank spaces where the **VISTA** entry's should appear. In the following example, we have highlighted the entry and inserted **\*VISTA entry needed** in place of a blank entry.

#### **Example:** Organism Codes Print

LABORATORY INSTRUMENT CODE LIST		JAN 6,1997 09:53	PAGE 1
VITEK CODE	VITEK ENTRY	DHCP ENTRY	
-----			
yerefi	Yersiniaenterocolitica/frederi	YERSINIA ENTEROCOLIT	
yea	Yeast	YEAST	
vistr	Streptococcus anginosus(Strepm	STREPTOCOCCUS ANGINO	
virgrp	Viridansstreptococcusgroup	VIRIDANS STREPTOCOCC	
vibvul	Vibriovulnificus	VIBRIO VULNIFICUS	
vibpar	Vibrioparahaemolyticus	VIBRIO PARAHEMOLYTIC	
vibflu	Vibrioalvinis	*VISTA entry needed	
vibdam	Vibriodamsela	*VISTA entry needed	
vibcho	Vibriocholeerae	VIBRIO CHOLERAEE	
vibalg	Vibrioalginolyticus	VIBRIO ALGINOLYTICUS	
veipar	Veillonellaparvula	VEILLONELLA PARVULA	
unosac	Nonfermentinggramnegativebacil	BACILLUS, GRAM NEGAT	
unoasa	Nonfermentinggramnegativebacil	*VISTA entry needed	
unide	Unidentifiedorganism	UNIDENTIFIED FLYING	
unid	Unidentifiedorganism	UNIDENTIFIED FLYING	
tripul	Trichosporonpullulans	*VISTA entry needed	
tripen	Geotrichumpenicillatum	*VISTA entry needed	
tricap	Blastoschizomycescapitatus	*VISTA entry needed	

2. Edit the ETIOLOGY file to match the entries in the VITEK Organism table.

3. Enter the new organisms in the local entry of the Organism Code field (#1) of the LABORATORY INSTRUMENT CODE (LIC) file (#61.39).

**Example:** Edit Organism Codes in File #61.39

Prompt	Entry
Select LABORATORY INSTRUMENT CODE:	<b>VITEK</b>
Select ORGANISM CODE: esccol//	<RET>
ORGANISM CODE: esccol//	<RET> [Note: This is the SYSTEM code in VITEK ORGANISM table.]
ORGANISM INTERPRETATION:	<b>Escherichia Coli</b> [Note: This is the NAME code in the VITEK ORGANISM table.]
LOCAL ORGANISM ENTRY:	<b>ESCHERICHIA COLI</b> [Note: This is the Name field in the <b>VISTA</b> ETIOLOGY FIELD file.]

ANTIMICROBIAL SUSCEPTIBILITY file (#62.04)

Refer to the Planning and Implementation (PIG) manual pages 91 through 92.

1. Print the antibiotic codes using the Antibiotic Code Print option. The printout should show blank spaces where the **VISTA** entries are needed. In the following example, we have highlighted the entry and inserted **\*VISTA entry needed** in place of a blank entry.

**Example:** Antibiotic Code Print

LABORATORY INSTRUMENT CODE LIST		JAN 6,1997 10:00	PAGE 1
DHCP ENTRY	VITEK ENTRY	ANTI CODE	
-----			
AMOXICILLIN	Amoxicillin/CA	amc	
GENTMCN	Gentamicin	gm	
CEFOTAXIME	Cefotaxime	tax	
MEZLOCILLIN	Mezlocillin	mz	
PIPERACILLIN	Piperacillin	pip	
CHLORAM	N/A	chl	
FOSFOMYCIN	Fosfomicin	fos	
DOXYCYCLIN	Doxycycline	dx	
ERYTHROMYCIN	Erythromycin	e	
*VISTA entry needed	Enrofloxacin(Vet.)	efx	
VANCMCN	Vancomycin	va	
*VISTA entry needed	Teicoplanin	tpn	
TOBRMCN	Tobramycin	tob	
*VISTA entry needed	Trimethoprim	tmp	

2. Edit ANTIMICROBIAL SUSCEPTIBILITY file to match the entries in the VITEK Antimicrobial table.



3. Enter the new antibiotics in the local Antibiotic field (#2) of the LIC file (#61.39).

**Example:** Edit Antibiotic Codes in File #61.39

Prompt	Entry
Select LABORATORY INSTRUMENT CODE:	<b>VITEK</b>
Select ANTIBIOTIC CODE: tet//	< <b>RET</b> >
ANTIBIOTIC CODE: tet//	< <b>RET</b> > [ <b>Note</b> This is the SYSTEM code in VITEK antimicrobial table.]
ANTIBIOTIC INTERPRETATION:	<b>Tetracycline</b> [ <b>Note</b> This is the NAME code in the VITEK Antimicrobial table.]
LOCAL ANTIBIOTIC ENTRY:	<b>TETRCLN</b> [ <b>Note</b> This is the Name field in the <b>VISTA</b> ANTIMICROBIAL SUSCEPTIBILITY file.]

4. Edit ANTIMICROBIAL SUSCEPTIBILITY file for susceptibility results and interpretation translations. Although the Minimum Inhibitory Concentration (MIC) values and interpretations are uploaded from the VITEK, these values must also be defined in File #62.04. The MIC values entered in File #62.04 **must match exactly** with the values from the VITEK, including, leading and trailing 0's. (that is, if <=0.5 is sent from the VITEK <=0.5 must be entered in File #62.04. If <=.5 is entered in File #62.04, this will not work).
5. Alternate interpretations, if used in the VITEK, must also be defined in File #62.04.

#### LABORATORY TEST file (#60)

Use of the Culture ID Prefix field (#412). Refer to the Laboratory V. 5.2 Technical Manual, page 60. An alternative solution to this is to define each microbiology test, which is run on the VITEK, to have a Unique Accession number by setting the Unique Accession Number field (#7) to YES in File #60.

### MICRO INSTRUMENT SET UP file (#61.38)

This file has the following three functions:

- The Prefix field (#1), in cooperation with edits in the LABORATORY TEST file (#60), allows multiple tests per accession to be run on the VITEK. In File #61.38, the Prefix field needs to be enabled with a YES entry.
- This file enables the use of Patient Wild fields instead of a defined table on the VITEK. You have the option to create VITEK tables for the following data elements:
  - \* Patient Location
  - \* Requesting Physician
  - \* Specimen Source
  - \* Patient Hospital Service
  - \* Other

The information contained in the created VITEK tables **must** be an exact match with the corresponding **VISTA** file entries. Moreover, these VITEK tables must be maintained by the user as **VISTA** file changes occur.

- An alternative approach is the use of the WILD CARD functionality in File #61.38. There are five possible wild card fields available for downloading.
  - \* Report Routing Location
  - \* Requesting Physician
  - \* Collection Sample
  - \* Treating Specialty
  - \* Beeper Number

To initiate the use of wild card functionality you must:

1. Set the Wild Card On field (#2) to YES in File #61.38.
2. Determine which wild card fields are going to be used.
3. Associate the w1, w2, w3, w4, w5 fields in File #61.38, with the corresponding set of codes:

LRWRD is the Report Routing Location field in the ACCESSION file (#68).

LRDOC is the Requesting Physician field in the ACCESSION file (#68).

LRSPEC is the Collection Sample field in the ACCESSION file (#68).

LRTREAT is the Treating Specialty field in the ACCESSION file (#68).

LRBEEP is the Beeper field in the NEW PERSON file (#200).

An example of this file edit can be found in the LA\*5.2\*12 patch documentation on page 31.

4. Enable the Patient Wild fields w1, w2, w3, w4, w5 on the VITEK. Please refer to the Bi-directional Computer Interface Specifications for bioLIASION manual, the Utility section, page 14.

#### LABORATORY SITE file (#69.9)

The Download Full Data field is used to determine if all data, as opposed to just the required fields as defined by the VITEK, will be included in the download. This field is a switch and if desired can be turned on by entering a YES. For a listing of required fields, refer to the information on page 3 in the Download section of the Bi-directional Computer Interface Specifications for bioLIASION manual.

#### LOAD/WORK LIST file (#68.2)

Please refer to the LA\*5.2\*12 patch documentation, page 28.

#### AUTO INSTRUMENT file (#62.4)

Please refer to the LA\*5.2\*12 patch documentation, page 29.

#### ACCESSION file (#68)

Since there is a six digit limitation of the accession number for the VITEK, the accession area used for the VITEK **must** have the TYPE OF ACCESSION NUMBER defined as SHORT. The Universal ID number generated as a result of the Universal Interface patches LA\*5.2\*17 and LR\*5.2\*65 is not compatible with the VITEK Exam ID number field.

## Interface Configuration

The lab LSI must have V. 2 EPROMS installed to enable bi-directional communications. You can obtain V. 2 EPROMS by contacting any Chief Information Officer Field Office (CIOFO). Installation instructions for V. 2 EPROMS is in the Laboratory V. 5.2 Technical manual.

## Analyzer Configuration (VITEK)

Edit the following settings:

Baud rate - **2400**  
 Parity - **NONE**  
 Bits - **8**  
 Stop bits - **1**

For protocol setup, please refer to LA\*5.2\*12 patch documentation on page 20.

**Note** Protocol settings, specifically the timeouts and delays, may require slight adjustments depending upon your system's response time.

Below are protocol settings that are currently in use at the Alpha and Beta test sites. Please refer to this table as a guide for any adjustments your site may need to make.

### Communication Protocol Parameters Setup

<b>Sites</b>	<b>Delay</b>	<b>Retries</b>	<b>Timeout</b>
Hampton VAMC (Alpha)	Last Master: <b>10</b> Inter Record: <b>10</b> Inter Message: <b>2</b>	ENQ limit: <b>3</b> ENQ interval: <b>10</b> Checksum limit: <b>3</b> Checksum interval: <b>10</b>	Checksum: <b>10</b> Host Response: <b>10</b>
Muskogee VAMC (MSM)	Last Master: <b>2</b> Inter Record: <b>0</b> Inter Message: <b>2</b>	ENQ Limit: <b>3</b> ENQ interval: <b>10</b> Checksum limit: <b>3</b> Checksum interval: <b>10</b>	Checksum: <b>3</b> Host response: <b>3</b>
Tampa VAMC (Alpha)	Last Master: <b>10</b> Inter Record: <b>10</b> Inter Message: <b>2</b>	ENQ limit: <b>3</b> ENQ Interval: <b>10</b> Checksum limit: <b>3</b> Checksum interval: <b>10</b>	Checksum: <b>10</b> Host response: <b>10</b>

- |  |  |  |  |
|--|--|--|--|
|  |  |  |  |
|--|--|--|--|
1. Enable the upload and define required upload fields. Refer to: Bi-directional Computer Interface Specifications for bioLIASION manual, the Utility section, pages 2 through 12.
  2. Enable the download and define required download fields. Refer to the Bi-directional Computer Interface Specifications for bioLIASION manual, the Utility section, pages 12 through 14.
  3. Start the Bi-directional Computer Interface (BCI). For systems that use the BCI Utilities, refer to Bi-directional Computer Interface Specifications for bioLIASION manual, the Utility section, pages 14 through 15.

The VITEK has the capability allowing alternate interpretations. If your site is using these interpretations as defined in the ANTIMICROBIAL SUSCEPTIBILITY file #62.04, those interpretations must be defined in the VITEK system also.

The **VISTA** VITEK literal interface supports the use of Conditional Antimicrobial Reporting (CAR). Please refer to the Bi-directional Computer Interface Specifications for bioLIASION manual, the Utility section, page nine for more information.

## Confirming Data Transmission

### **Upload (VITEK --> LSI --> VISTA)**

1. Send data from analyzer to the interface

The VITEK allows a test pattern to be sent to the host (**VISTA**) system. Confirmation of data being sent can be seen in the VITEK Upload Transaction Log. Please refer to Bi-directional Computer Interface Specifications for bioLIASION manual, the Utility section, pages 15 through 17.

2. Send data from interface to **VISTA**

This test pattern data will be seen in ^LA(X,"I" nodes. X represents the port in use for the VITEK or the auto instrument internal file number for the VITEK.

### **Download (VISTA --> LSI --> VITEK)**

1. Send data from **VISTA** to the interface

- Using your test patient, accession a microbiology test.
- Add the accession(s) to the VITEK load/worklist using the option VITEK Load/Worklist (Build) [LA MI VITEK L/W BUILD].
- Use the option Download Load/Worklist [LADOWN] selecting VITEK as the Load/Worklist name. At this point, data in ^LA(X,"O" nodes can be viewed.

1. Send data from interface to the equipment

Confirmation of data being sent can be seen in the VITEK Download Transaction Log. Please refer to Bi-directional Computer Interface Specifications for bioLIASION manual, the Utility section, page 18.

## User Training and Education

User training, on the functionality of this interface, should be coordinated by the Laboratory Information Manager (LIM). Training should include an overview of the verification process, as well as basic troubleshooting as indicated in the troubleshooting section.

## Verification and Workload

- Refer to the Verification section LA\*5.2\*12 patch documentation, pages 32 through 36.
- Antimicrobials are presented for verification in alphabetical order by card.
- Editing of verified results can be accomplished through these three options:
  - \* RE - Results Entry
  - \* VITEK Literal Verification option
  - \* EM - Enter/Edit/Modify data (manual)
- This interface supports Laboratory Management Index Program (LMIP) Workload reporting.



## Troubleshooting

This section provides information for common problems you might encounter.

Problem	Check
<b>No data in ^LA (upload)</b>	<ul style="list-style-type: none"> <li>• VITEK protocol setting</li> <li>• VITEK's Upload Configuration menu to ensure that the upload field is Enabled               <ul style="list-style-type: none"> <li>♦ Status of the VITEK Upload Transaction Log</li> <li>♦ Wiring connections for conductivity.</li> <li>♦ LSI port.</li> <li>♦ Status of the LAB job</li> </ul> </li> </ul>
<b>No data in ^LAH (upload)</b>	<ul style="list-style-type: none"> <li>• LOADLIST file</li> <li>• AUTO INSTRUMENT file</li> <li>• LIC file               <ul style="list-style-type: none"> <li>♦ Organisms</li> <li>♦ antimicrobial</li> </ul> </li> <li>• Error log for any error involving the LAMIVTLP routine</li> <li>• Status of the VITEK transaction logs</li> </ul>
<b>No downloaded data in the VITEK</b>	<ul style="list-style-type: none"> <li>• AUTO INSTRUMENT file               <ul style="list-style-type: none"> <li>♦ File Build Entry field should contain the routine name LAMIVTLD</li> <li>♦ Handshake Response field should contain the routine LAMIVTLX</li> </ul> </li> <li>• Status of the LSI and the LAB job for proper functionality</li> <li>• Status of other Auto instruments running on the same LSI</li> <li>• Status of the VITEK Download Transaction Log</li> <li>• VITEK's Download Configuration menu</li> </ul>

	to ensure that the download field is Enabled.
--	---

<b>Problem</b>	<b>Check</b>
<b>Susceptibility is not available on an antimicrobial for verification</b>	<ul style="list-style-type: none"><li>• Look at the ANTIMICROBIAL SUSCEPTIBILITY file for matching MIC values with the VITEK.</li></ul>
<b>Antimicrobial and susceptibility are not presented for verification</b>	<ul style="list-style-type: none"><li>• ANTIMICROBIAL SUSCEPTIBILITY file</li><li>• Antimicrobial and proper definition</li><li>• LIC file</li><li>• Proper definition of the antimicrobial</li></ul>
<b>Antimicrobial is not printing on patient reports</b>	<ul style="list-style-type: none"><li>• ANTIMICROBIAL SUSCEPTIBILITY file<ul style="list-style-type: none"><li>♦ RESTRICTED DISPLAY field</li><li>♦ Conditional antimicrobial reporting (CAR) on the VITEK is enabled</li></ul></li></ul>
<b>Organism is not available for verification</b>	<ul style="list-style-type: none"><li>• ETIOLOGY FIELD file<ul style="list-style-type: none"><li>♦ Organism and proper definition</li></ul></li><li>• LIC file<ul style="list-style-type: none"><li>♦ Organism and proper definition</li></ul></li></ul>

## Glossary

<b>Download</b>	The process that sends data from <b>VISTA</b> to the VITEK analyzer.
<b>Upload</b>	The process by which data is sent from the VITEK analyzer to <b>VISTA</b> .
<b>Interface equipment</b>	For the VITEK to <b>VISTA</b> project the Interface equipment refers to the LSI (Laboratory System Interface).
<b>Wild Cards</b>	Fields that enable downloading of supplementary demographic information not having an associated VITEK table.

## Appendix A

### Full Download Record

The following example is a download record of a laboratory test for a patient.

**Note** The first two lower case characters after the "|" represent the VITEK Field Name as defined in the Bi-directional Computer Interface Specifications for bioLIASION manual, the Download section, pages 4 through 7.

#### Example

```
^LA(9,"O",22) = mtmpr|pnTEST, PATIENT .|pi123456789|pb01/01/34|psm|
^LA(9,"O",23) = w2PHYSICIAN|si|ssURINE|st7X100|slLOCI|sxUNK|
^LA(9,"O",24) = s109/26/95||s214:26|s309/26/95|s414:26|sc|
^LA(9,"O",25) = ci22270|ctCULTUR|
^LA(9,"O",26) = 36
```

## Appendix B

### Upload Record

The following example is an upload record of laboratory results for a patient.

**Note** The first two lower case characters after the "|" represent the VITEK Field Name as defined in the Bi-directional Computer Interface Specifications for bioLIAISON manual, the Upload section, pages 4 through 15.

#### Example

```

^LA(3,"ENV") = VAH^ROU^673A01^ROU:673A01
^LA(3,"I") = 65
^LA(3,"I",0) = 201
^LA(3,"I",1) = ~E
^LA(3,"I",2) = ~B
^LA(3,"I",3) = ~^
^LA(3,"I",4) = mtrsl|pi708163691|pnTEST,PATIENT|w2PHYSICIAN|si|
                    ssURINE|s5URINE|st7X100|s~^
^LA(3,"I",5) = 6URINE|s17SNE|s77SNE|sxNEUROL|s9NEUROLOGY|s109/27/95|s214:1
                    6|s309/27/95|s414:16|~^
^LA(3,"I",6) = ci9|ctCULTUR|cncULTURE AND SENSITIVITY|c109/29/95|c211:28|
                    c3P|c4Preliminary|~^
^LA(3,"I",7) = rtgns-f6|t10|rr1|rnGram Negative General Susceptibility -
F6|t2SU|t3Susceptibilit~^
^LA(3,"I",8) = y|t4F|t5Final|o1promir|o2Proteus
mirabilis|o5Rare|a1am|a2Ampicillin|
                    a32|a4S|a1ams|a2Amp~^
^LA(3,"I",9) = icillin/sulbactam|a3<=4|a4S|a1azm|a2Aztreonam|a3<=8|a4S|a1cip|
                    a2Ciprofloxacin|a3~^
^LA(3,"I",10) =
<=0.5|a4S|a1imi|a2Imipenem|a3<=4|a4S|a1mz|a2Mezlocillin|a3<=16|a4S|
                    a1pip|a2Piper~^
^LA(3,"I",11) =
acillin|a3<=8|a4S|a1tic|a2Ticarcillin|a3<=16|a4S|a1tcc|a2Ticarcillin/CA|
                    a3<=16|a~^
^LA(3,"I",12) = 4S|a1sxt|a2Trimethoprim/Sulfa|a3>=320|a4R|a1ofx|a2Ofloxacin|
                    a3<=1|a4S|zz|~]
^LA(3,"I",13) = d0
^LA(3,"I",14) = ~^
^LA(3,"I",15) = CA|a3<=16|a4S|a1sxt|a2Trimethoprim/Sulfa|a3>=320|a4R|
                    alofx|a2Ofloxacin|a32|a4S|z~^
^LA(3,"I",16) = z|~]
^LA(3,"I",17) = 45
^LA(3,"I",18) = ~

```

